RAW SEQUENCE LISTING
PATENT APPLICATION: US/09/662,454

DATE: 09/25/2000
TIME: 15:16:15

ENTERED

Input Set : A:\20264276.app
Output Set: N:\CRF3\09252000\I662454.raw

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 3 <110> APPLICANT: Yanagi, Masayuki
 4         Emerson, Susanne U.
 5         Purcell, Robert H.
 6         Bukh, Jens
 8 <120> TITLE OF INVENTION: CLONED GENOMES OF INFECTIOUS HEPATITIS C VIRUSES AND
 9         USES THEREOF
11 <130> FILE REFERENCE: 20264276US1
C--> 13 <140> CURRENT APPLICATION NUMBER: US/09/662,454
C--> 14 <141> CURRENT FILING DATE: 2000-09-14
16 <150> PRIOR APPLICATION NUMBER: US 60/053,062
17 <151> PRIOR FILING DATE: 1997-07-18
19 <150> PRIOR APPLICATION NUMBER: US 09/014,416
20 <151> PRIOR FILING DATE: 1998-01-27
22 <160> NUMBER OF SEQ ID NOS: 65
24 <170> SOFTWARE: PatentIn Ver. 2.1
26 <210> SEQ ID NO: 1
27 <211> LENGTH: 3011
28 <212> TYPE: PRT
29 <213> ORGANISM: Hepatitis C virus
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33    1               5                  10                  15
35 Arg Arg Pro Gln Asp Val Lys Phe Pro Gly Gly Gly Gln Ile Val Gly
36              20                  25                  30
38 Gly Val Tyr Leu Leu Pro Arg Arg Gly Pro Arg Leu Gly Val Arg Ala
39              35                  40                  45
41 Thr Arg Lys Thr Ser Glu Arg Ser Gln Pro Arg Gly Arg Arg Gln Pro
42         50                  55                  60
44 Ile Pro Lys Ala Arg Arg Pro Glu Gly Arg Thr Trp Ala Gln Pro Gly
45    65                  70                  75                  80
47 Tyr Pro Trp Pro Leu Tyr Gly Asn Glu Gly Cys Gly Trp Ala Gly Trp
48              85                  90                  95
50 Leu Leu Ser Pro Arg Gly Ser Arg Pro Ser Trp Gly Pro Thr Asp Pro
51             100                 105                 110
53 Arg Arg Arg Ser Arg Asn Leu Gly Lys Val Ile Asp Thr Leu Thr Cys
54            115                  120                 125
56 Gly Phe Ala Asp Leu Met Gly Tyr Ile Pro Leu Val Gly Ala Pro Leu
57         130                 135                 140
59 Gly Gly Ala Ala Arg Ala Leu Ala His Gly Val Arg Val Leu Glu Asp
60 145                 150                 155                 160
62 Gly Val Asn Tyr Ala Thr Gly Asn Leu Pro Gly Cys Ser Phe Ser Ile
63             165                 170                 175
65 Phe Leu Leu Ala Leu Leu Ser Cys Leu Thr Val Pro Ala Ser Ala Tyr
66             180                 185                 190
68 Gln Val Arg Asn Ser Ser Gly Leu Tyr His Val Thr Asn Asp Cys Pro
69            195                  200                 205
71 Asn Ser Ser Ile Val Tyr Glu Ala Ala Asp Ala Ile Leu His Thr Pro
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72      210                 215                 220
74 Gly Cys Val Pro Cys Val Arg Glu Gly Asn Ala Ser Arg Cys Trp Val
75 225                 230                 235                 240
77 Ala Val Thr Pro Thr Val Ala Thr Arg Asp Gly Lys Leu Pro Thr Thr
78                 245                 250                 255
80 Gln Leu Arg Arg His Ile Asp Leu Leu Val Gly Ser Ala Thr Leu Cys
81             260                 265                 270
83 Ser Ala Leu Tyr Val Gly Asp Leu Cys Gly Ser Val Phe Leu Val Gly
84         275                 280                 285
86 Gln Leu Phe Thr Phe Ser Pro Arg Arg His Trp Thr Thr Gln Asp Cys
87     290                 295                 300
89 Asn Cys Ser Ile Tyr Pro Gly His Ile Thr Gly His Arg Met Ala Trp
90 305                 310                 315                 320
92 Asp Met Met Met Asn Trp Ser Pro Thr Ala Ala Leu Val Val Ala Gln
93             325                 330                 335
95 Leu Leu Arg Ile Pro Gln Ala Ile Met Asp Met Ile Ala Gly Ala His
96         340                 345                 350
98 Trp Gly Val Leu Ala Gly Ile Ala Tyr Phe Ser Met Val Gly Asn Trp
99         355                 360                 365
101 Ala Lys Val Leu Val Val Leu Leu Leu Phe Ala Gly Val Asp Ala Glu
102     370                 375                 380
104 Thr His Val Thr Gly Gly Asn Ala Gly Arg Thr Thr Ala Gly Leu Val
105 385                 390                 395                 400
107 Gly Leu Leu Thr Pro Gly Ala Lys Gln Asn Ile Gln Leu Ile Asn Thr
108             405                 410                 415
110 Asn Gly Ser Trp His Ile Asn Ser Thr Ala Leu Asn Cys Asn Glu Ser
111             420                 425                 430
113 Leu Asn Thr Gly Trp Leu Ala Gly Leu Phe Tyr Gln His Lys Phe Asn
114         435                 440                 445
116 Ser Ser Gly Cys Pro Glu Arg Leu Ala Ser Cys Arg Arg Leu Thr Asp
117     450                 455                 460
119 Phe Ala Gln Gly Trp Gly Pro Ile Ser Tyr Ala Asn Gly Ser Gly Leu
120 465                 470                 475                 480
122 Asp Glu Arg Pro Tyr Cys Trp His Tyr Pro Pro Arg Pro Cys Gly Ile
123             485                 490                 495
125 Val Pro Ala Lys Ser Val Cys Gly Pro Val Tyr Cys Phe Thr Pro Ser
126         500                 505                 510
128 Pro Val Val Val Gly Thr Thr Asp Arg Ser Gly Ala Pro Thr Tyr Ser
129     515                 520                 525
131 Trp Gly Ala Asn Asp Thr Asp Val Phe Val Leu Asn Asn Thr Arg Pro
132     530                 535                 540
134 Pro Leu Gly Asn Trp Phe Gly Cys Thr Trp Met Asn Ser Thr Gly Phe
135 545                 550                 555                 560
137 Thr Lys Val Cys Gly Ala Pro Pro Cys Val Ile Gly Gly Val Gly Asn
138             565                 570                 575
140 Asn Thr Leu Leu Cys Pro Thr Asp Cys Phe Arg Lys His Pro Glu Ala
141         580                 585                 590
143 Thr Tyr Ser Arg Cys Gly Ser Gly Pro Trp Ile Thr Pro Arg Cys Met
144         595                 600                 605
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```
146 Val Asp Tyr Pro Tyr Arg Leu Trp His Tyr Pro Cys Thr Ile Asn Tyr
147     610             615             620
149 Thr Ile Phe Lys Val Arg Met Tyr Val Gly Gly Val Glu His Arg Leu
150 625             630             635                 640
152 Glu Ala Ala Cys Asn Trp Thr Arg Gly Glu Arg Cys Asp Leu Glu Asp
153             645             650             655
155 Arg Asp Arg Ser Glu Leu Ser Pro Leu Leu Leu Ser Thr Thr Gln Trp
156             660             665             670
158 Gln Val Leu Pro Cys Ser Phe Thr Thr Leu Pro Ala Leu Ser Thr Gly
159         675             680             685
161 Leu Ile His Leu His Gln Asn Ile Val Asp Val Gln Tyr Leu Tyr Gly
162     690             695             700
164 Val Gly Ser Ser Ile Ala Ser Trp Ala Ile Lys Trp Glu Tyr Val Val
165 705             710             715                 720
167 Leu Leu Phe Leu Leu Leu Ala Asp Ala Arg Val Cys Ser Cys Leu Trp
168             725             730             735
170 Met Met Leu Leu Ile Ser Gln Ala Glu Ala Ala Leu Glu Asn Leu Val
171             740             745             750
173 Ile Leu Asn Ala Ala Ser Leu Ala Gly Thr His Gly Leu Val Ser Phe
174         755             760             765
176 Leu Val Phe Phe Cys Phe Ala Trp Tyr Leu Lys Gly Arg Trp Val Pro
177     770             775             780
179 Gly Ala Val Tyr Ala Leu Tyr Gly Met Trp Pro Leu Leu Leu Leu Leu
180 785             790             795                 800
182 Leu Ala Leu Pro Gln Arg Ala Tyr Ala Leu Asp Thr Glu Val Ala Ala
183             805             810             815
185 Ser Cys Gly Gly Val Val Leu Val Gly Leu Met Ala Leu Thr Leu Ser
186             820             825             830
188 Pro Tyr Tyr Lys Arg Tyr Ile Ser Trp Cys Met Trp Trp Leu Gln Tyr
189         835             840             845
191 Phe Leu Thr Arg Val Glu Ala Gln Leu His Val Trp Val Pro Pro Leu
192     850             855             860
194 Asn Val Arg Gly Gly Arg Asp Ala Val Ile Leu Leu Met Cys Val Val
195 865             870             875                 880
197 His Pro Thr Leu Val Phe Asp Ile Thr Lys Leu Leu Leu Ala Ile Phe
198             885             890             895
200 Gly Pro Leu Trp Ile Leu Gln Ala Ser Leu Leu Lys Val Pro Tyr Phe
201             900             905             910
203 Val Arg Val Gln Gly Leu Leu Arg Ile Cys Ala Leu Ala Arg Lys Ile
204         915             920             925
206 Ala Gly Gly His Tyr Val Gln Met Ala Ile Ile Lys Leu Gly Ala Leu
207     930             935             940
209 Thr Gly Thr Tyr Val Tyr Asn His Leu Thr Pro Leu Arg Asp Trp Ala
210 945             950             955                 960
212 His Asn Gly Leu Arg Asp Leu Ala Val Ala Val Glu Pro Val Val Phe
213             965             970             975
215 Ser Arg Met Glu Thr Lys Leu Ile Thr Trp Gly Ala Asp Thr Ala Ala
216         980             985             990
218 Cys Gly Asp Ile Ile Asn Gly Leu Pro Val Ser Ala Arg Arg Gly Gln
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219         995              1000              1005
221 Glu Ile Leu Leu Gly Pro Ala Asp Gly Met Val Ser Lys Gly Trp Arg
222     1010              1015              1020
224 Leu Leu Ala Pro Ile Thr Ala Tyr Ala Gln Gln Thr Arg Gly Leu Leu
225 1025              1030              1035              1040
227 Gly Cys Ile Ile Thr Ser Leu Thr Gly Arg Asp Lys Asn Gln Val Glu
228              1045              1050              1055
230 Gly Glu Val Gln Ile Val Ser Thr Ala Thr Gln Thr Phe Leu Ala Thr
231              1060              1065              1070
233 Cys Ile Asn Gly Val Cys Trp Thr Val Tyr His Gly Ala Gly Thr Arg
234     1075              1080              1085
236 Thr Ile Ala Ser Pro Lys Gly Pro Val Ile Gln Met Tyr Thr Asn Val
237     1090              1095              1100
239 Asp Gln Asp Leu Val Gly Trp Pro Ala Pro Gln Gly Ser Arg Ser Leu
240 1105              1110              1115              1120
242 Thr Pro Cys Thr Cys Gly Ser Ser Asp Leu Tyr Leu Val Thr Arg His
243              1125              1130              1135
245 Ala Asp Val Ile Pro Val Arg Arg Arg Gly Asp Ser Arg Gly Ser Leu
246              1140              1145              1150
248 Leu Ser Pro Arg Pro Ile Ser Tyr Leu Lys Gly Ser Ser Gly Gly Pro
249     1155              1160              1165
251 Leu Leu Cys Pro Ala Gly His Ala Val Gly Leu Phe Arg Ala Ala Val
252     1170              1175              1180
254 Cys Thr Arg Gly Val Ala Lys Ala Val Asp Phe Ile Pro Val Glu Asn
255 1185              1190              1195              1200
257 Leu Gly Thr Thr Met Arg Ser Pro Val Phe Thr Asp Asn Ser Ser Pro
258              1205              1210              1215
260 Pro Ala Val Pro Gln Ser Phe Gln Val Ala His Leu His Ala Pro Thr
261              1220              1225              1230
263 Gly Ser Gly Lys Ser Thr Lys Val Pro Ala Ala Tyr Ala Ala Gln Gly
264     1235              1240              1245
266 Tyr Lys Val Leu Val Leu Asn Pro Ser Val Ala Ala Thr Leu Gly Phe
267     1250              1255              1260
269 Gly Ala Tyr Met Ser Lys Ala His Gly Val Asp Pro Asn Ile Arg Thr
270 1265              1270              1275              1280
272 Gly Val Arg Thr Ile Thr Thr Gly Ser Pro Ile Thr Tyr Ser Thr Tyr
273              1285              1290              1295
275 Gly Lys Phe Leu Ala Asp Gly Gly Cys Ser Gly Gly Ala Tyr Asp Ile
276              1300              1305              1310
278 Ile Ile Cys Asp Glu Cys His Ser Thr Asp Ala Thr Ser Ile Leu Gly
279     1315              1320              1325
281 Ile Gly Thr Val Leu Asp Gln Ala Glu Thr Ala Gly Ala Arg Leu Val
282     1330              1335              1340
284 Val Leu Ala Thr Ala Thr Pro Pro Gly Ser Val Thr Val Ser His Pro
285 1345              1350              1355              1360
287 Asn Ile Glu Glu Val Ala Leu Ser Thr Thr Gly Glu Ile Pro Phe Tyr
288              1365              1370              1375
290 Gly Lys Ala Ile Pro Leu Glu Val Ile Lys Gly Gly Arg His Leu Ile
291              1380              1385              1390
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293 Phe Cys His Ser Lys Lys Lys Cys Asp Glu Leu Ala Ala Lys Leu Val
294          1395                1400                1405
296 Ala Leu Gly Ile Asn' Ala Val Ala Tyr Tyr Arg Gly Leu Asp Val Ser
297    1410               1415                1420
299 Val Ile Pro Thr Ser Gly Asp Val Val Val Val Ser Thr Asp Ala Leu
300 1425               1430                1435                1440
302 Met Thr Gly Phe Thr Gly Asp Phe Asp Ser Val Ile Asp Cys Asn Thr
303               1445                1450                1455
305 Cys Val Thr Gln Thr Val Asp Phe Ser Leu Asp Pro Thr Phe Thr Ile
306          1460          .  1465                1470
308 Glu Thr Thr Thr Leu Pro Gln Asp Ala Val Ser Arg Thr Gln Arg Arg
309          1475                1480                1485
311 Gly Arg Thr Gly Arg Gly Lys Pro Gly Ile Tyr Arg Phe Val Ala Pro
312    1490               1495                1500
314 Gly Glu Arg Pro Ser Gly Met Phe Asp Ser Ser Val Leu Cys Glu Cys
315 1505               1510                1515                1520
317 Tyr Asp Ala Gly Cys Ala Trp Tyr Glu Leu Thr Pro Ala Glu Thr Thr
318               1525                1530                1535
320 Val Arg Leu Arg Ala Tyr Met Asn Thr Pro Gly Leu Pro Val Cys Gln
321          1540                1545                1550
323 Asp His Leu Glu Phe Trp Glu Gly Val Phe Thr Gly Leu Thr His Ile
324          1555                1560                1565
326 Asp Ala His Phe Leu Ser Gln Thr Lys Gln Ser Gly Glu Asn Phe Pro
327    1570               1575                1580
329 Tyr Leu Val Ala Tyr Gln Ala Thr Val Cys Ala Arg Ala Gln Ala Pro
330 1585               1590                1595                1600
332 Pro Pro Ser Trp Asp Gln Met Trp Lys Cys Leu Ile Arg Leu Lys Pro
333               1605                1610                1615
335 Thr Leu His Gly Pro Thr Pro Leu Leu Tyr Arg Leu Gly Ala Val Gln
336          1620                1625                1630
338 Asn Glu Val Thr Leu Thr His Pro Ile Thr Lys Tyr Ile Met Thr Cys
339          1635                1640                1645
341 Met Ser Ala Asp Leu Glu Val Val Thr Ser Thr Trp Val Leu Val Gly
342    1650               1655                1660
344 Gly Val Leu Ala Ala Leu Ala Ala Tyr Cys Leu Ser Thr Gly Cys Val
345 1665               1670                1675                1680
347 Val Ile Val Gly Arg Ile Val Leu Ser Gly Lys Pro Ala Ile Ile Pro
348               1685                1690                1695
350 Asp Arg Glu Val Leu Tyr Gln Glu Phe Asp Glu Met Glu Glu Cys Ser
351               1700                1705                1710
353 Gln His Leu Pro Tyr Ile Glu Gln Gly Met Met Leu Ala Glu Gln Phe
354          1715                1720                1725
356 Lys Gln Lys Ala Leu Gly Leu Leu Gln Thr Ala Ser Arg His Ala Glu
357    1730               1735                1740
359 Val Ile Thr Pro Ala Val Gln Thr Asn Trp Gln Lys Leu Glu Val Phe
360 1745               1750                1755                1760
362 Trp Ala Lys His Met Trp Asn Phe Ile Ser Gly Ile Gln Tyr Leu Ala
363          1765                1770                1775
365 Gly Leu Ser Thr Leu Pro Gly Asn Pro Ala Ile Ala Ser Leu Met Ala
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VERIFICATION SUMMARY   DATE: 09/25/2000
PATENT APPLICATION: US/09/662,454   TIME: 15:16:16

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L:14 M:271 C: Current Filing Date differs, Replaced Current Filing Date